

Environmental Justice and Stormwater Management: An East Tampa Case

Study Towards Equitable Decision-making

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Abstract: African American communities experience higher incidences of health disparities due to inequitable exposures to environmental stressors. With the increase of climate threats, stormwater runoff and flooding are major concerns that can be linked to environmental injustice in African American communities, including illegal dumping, and even proximity to major highways. Efforts to improve stormwater (SW) management overlap with efforts to increase green space through the implementation of urban green infrastructure (UGI), presenting the opportunity for UGI to be utilized as a measure to improve geographical and social equity. However there are still many communities who have yet to transition into using green infrastructure for SW management and research is limited on how equitable current stormwater best management practices (SW BMPs) are, particularly in regards to management processes and decisions. The goal of this research is to characterize SW infrastructure in an African American community in Tampa, East Tampa, through the lens of sustainability and environmental justice to better inform management practices towards equitable management of SW infrastructure in the community.

INTRODUCTION

Objective: Characterize stormwater (SW) infrastructure based on sustainability and environmental justice indicators in East Tampa, Florida and identify SW locations in need of improvement to inform equitable decision making in the community.

East Tampa

- 34 stormwater ponds throughout community, 4 revitalized ponds
- Minimal UGI implementation in city and community.
- Community redevelopment area (CRA), 7.63 sq. mi.
- Surrounded by 2 major highways (I-4 and I-275) and 4 state roads
- 87% African American population, Average per capita income \$11,786
- SW management decision-making has involved community and city management stakeholders for revitalization efforts.



Figure 1. East Tampa CRA boundary.

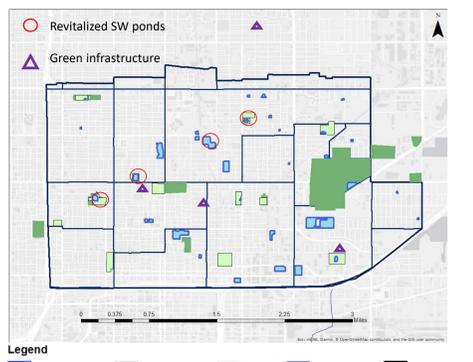


Figure 2. East Tampa SW infrastructure

METHODS

1. Conducted survey using Fulerum App for non-participant site observation of East Tampa SW infrastructure from June - July 2018.
 - a) Assessment based on sustainability and environmental justice indicators.
 - b) Indicators informed by minutes from public community meetings for more equitable decisions of potential multifunctional uses of SW spaces.
 - c) Indicators given score of 1 or 0, total summed, and each pond given percentage score and grade (A-F)
2. EPA Environmental Justice (EJ) Screen tool used to assess environmental justice characteristics around each of the 34 SW ponds at a 0.25-mi radius (walking distance for water infrastructure).

RESULTS

SW Pond Assessment and Modified SW Pond Index (mSPI)

Table 1. mSPI indicators and percent occurrence for n= 34 SW Ponds

Category	Indicator (Score=1)	% of Ponds
Environmental	Wildlife/vegetation	68
	Water Clear/odorless (also dry pond)	77
Economic	Nearby businesses	53
	Nearby food stores	12
Social	Benches located near pond or in park	24
	Drinking water fountains	18
	Recreation facilities available	27
	Community use/social interactions	68
Accessibility	Sidewalks present	65
	No fence present	29
	Public transportation	35
Crime/Public Safety	No litter	9
	CPTED measures (lighting, street art, community centers and/or CCTV)	91
Education	Nearby schools	21
	Nearby churches	24
	Nearby housing	97
	Educational signage	12

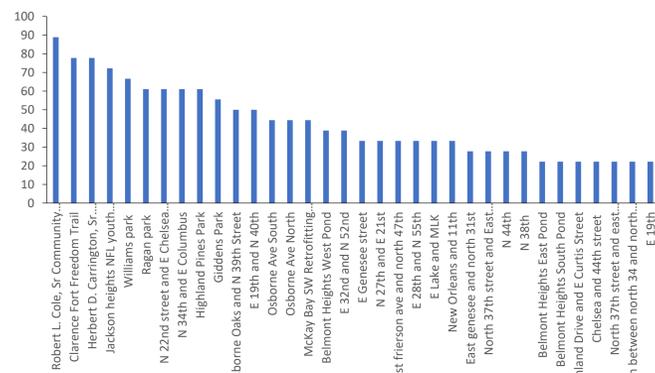


Figure 3. mSPI scores for each of the 34 SW ponds.

High Scoring Pond



Figure 4. Robert L. Cole Sr. Community Lake

Low-Scoring Pond



Figure 6. Pond on Chelsea and 44th Street.



Figure 5. Pond gazebo and safe lighting.



Figure 7. Chelsea and 44th street pond (close)

Environmental Justice Analysis

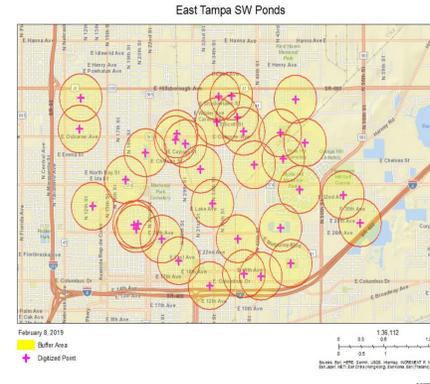


Figure 8. Map of EJScreen application for 34 ponds in East Tampa.

The ponds with the highest and lowest minority populations (E Genesee Street and Giddens Park, respectively) are shown in the table below for comparison of indicators.

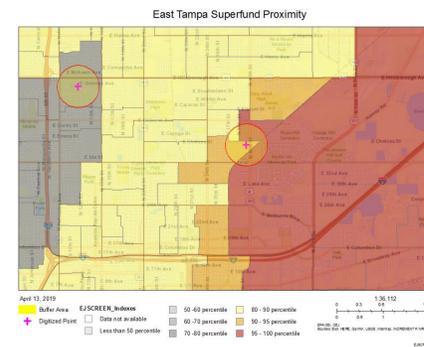


Figure 9. Superfund proximity indicator map and respective locations of Giddens Park (far left) and E Genesee Street ponds.

Table 2. EJ SCREEN comparison by minority population.

EJ Indicator	E Genesee Street	Giddens Park
Social Indicators		
Minority Population (%)	100	44
Low-Income Population (%)	64	37
Population Age Under 5 (%)	5	7
Population Age under 18 (%)**	19	15
Population Age over 64 (%)	20	12
Population with Less Than HS Education (%)	33	10
Owner-Occupied Housing (%)**	48	68
Linguistically Isolated (%)	0	6
Environmental Indicators		
NATA Diesel PM (µg/m ³)	1.5	1.86
NATA Cancer Risk (lifetime risk/million)	47	51
Traffic Proximity (daily traffic count/distance to road)	830	1500
Lead Paint Indicator (% pre-1960 housing)	0.35	0.68
Superfund Proximity (site count/km distance)	0.42	0.13
RMP Proximity (facility count/km distance)	3.2	1.3
Hazardous Waste Proximity (facility count/km distance)	2.4	0.98
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.0017	0.0027

RESULTS/DISCUSSION

The following pond recommendations for improvements were made based on respective mSPI scores and demonstrated need from the EJ Screen Analysis conducted (in order of suggested priority):

1. Williams Park
2. Jackson Heights NFL Youth Education Center
3. Highland Pines
4. Ragan Park
5. 22nd Street and Chelsea
6. Herbert D. Carrington, Sr. Community Lake (Fair Oaks)
7. Clarence Fort Freedom Trail
8. Giddens Park

Each of these ponds received a score of C or D and are suggested based on limited resources and potential for community partnerships to revitalize SW spaces.

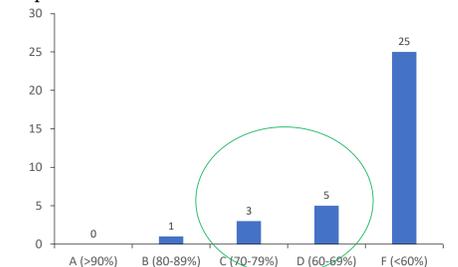


Figure 10. Grade distribution of ponds using mSPI.

CONCLUSIONS

This analysis demonstrated that the majority of SW ponds in East Tampa received a “failing grade (F)” based on the mSPI. Pond recommendations that were made reflect the potential for decision making in the community based on limited resources and identified priorities, however further input from both community and management stakeholders are needed to better validate results and promote more equitable decision making in the community. Future research will involve interviews and focus groups with stakeholders to understand the dimensions of the community that lead to such challenges with SW management.

Limitations and Future Research

1. Community input thus far limited to public meetings and informal conversations with stakeholders.
2. Further understanding of community history, culture and politics that influence management decision making is necessary for equitable decision-making.

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